3.3.4.4 Bedrock Glade

3.3.4.4.1 Community Overview

Bedrock glades are xeric, sparsely vegetated, non-vertical bedrock exposures, with thin, often discontinuous soils. The rock types vary from quartzite (Baraboo Hills, McCaslin Mountain), to basalt (lower St. Croix River valley), to granite (northeastern Wisconsin). The flora can include prairie, savanna, or barrens components, some of them reaching their northern range limits in this community type, as well as bare rock specialists. Tree and shrub cover is usually sparse, and often has structural similarities to a thinly timbered savanna or woodland habitat. Important woody species may include pines, oaks, hickories, and cherries, along with dogwood, hazelnuts, prairie willow, and ericads such as huckleberry. Xerophytic pteridophytes such as rusty woodsia, northern fragile fern, and rock spikemoss are characteristic plants, as are lichens and mosses. Glades have apparently served as refugia for light-demanding species that are adapted to the more open savanna and prairie conditions that were formerly much more abundant and widespread in parts of Wisconsin. Many uncommon plant species usually associated with these habitats were documented in the glades of the Baraboo Hills.

3.3.4.4.2 Vertebrate Species of Greatest Conservation Need Associated with Bedrock Glade

Eight vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with bedrock glade. Those eight species are shown in Table 3-99.

Table 3-99. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with bedrock glade communities.

Species Significantly Associated with Bedrock glade
Herptiles
Northern Prairie Skink
Prairie Ringneck Snake
Bullsnake
Western Ribbon Snake
Species Moderately Associated with Bedrock glade
Birds
Whip-poor-will
Blue-winged Warbler
Herptiles
Prairie Racerunner
Timber Rattlesnake

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-99 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both bedrock glade and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of bedrock glade in each of the Ecological Landscapes (Tables 3-100 and 3-101).

- Using the analysis described above, a species was further selected if it had both a significant association with bedrock glade and a high probability of occurring in an Ecological Landscape(s) that

represents a major opportunity for protection, restoration and/or management of bedrock glade. These species are shown in Figure 3-18.

Table 3-100. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with bedrock glade communities and their association with Ecological Landscapes that support bedrock glade.

Bedrock Glade

Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Herptiles (4)*			
	Northern Prairie Skink	Prairie Ringneck Snake	Bullsnake	Western Ribbon Snake
MAJOR				
Western Coulee and Ridges				
IMPORTANT				
Central Sand Hills				
Forest Transition				
Western Prairie				
PRESENT (MINOR)				
Central Sand Plains				

Color Key

= HIGH probability the species occurs in this Ecological Landscape

= MODERATE probability the species occurs in this Ecological Landscape

= LOW or NO probability the species occurs in this Ecological Landscape

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Table 3-101. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with bedrock glade communities and their association with Ecological Landscapes that support bedrock glade.

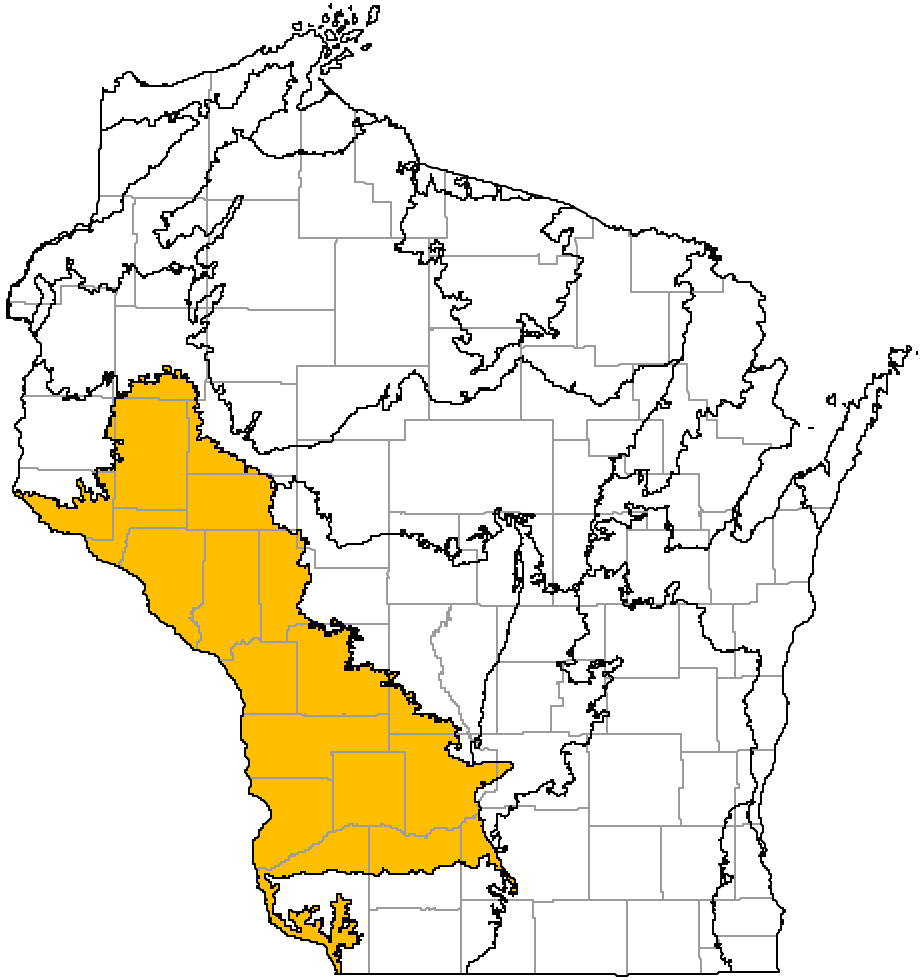
Bedrock Glade	Birds (2)*		Herptiles (2)	
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Whip-poor-will	Blue-winged Warbler	Prairie Racerunner	Timber Rattlesnake
MAJOR				
North Central Forest				
Western Coulee and Ridges				
IMPORTANT				
Central Lake Michigan Coastal				
Central Sand Hills				
Forest Transition				
Western Prairie				
PRESENT (MINOR)				
Central Sand Plains				
Northern Highland				
Northern Lake Michigan Coastal				
Northwest Lowlands				

Color Key

- = **HIGH probability the species occurs in this Ecological Landscape**
- = **MODERATE probability the species occurs in this Ecological Landscape**
- = **LOW or NO probability the species occurs in this Ecological Landscape**

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Figure 3-18. Vertebrate Species of Greatest Conservation Need that have *both* a significant association with bedrock glade *and* a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of bedrock glade.



Western Coulees and Ridges
Northern Prairie Skink
Prairie Ringneck Snake
Bullsnake

3.3.4.4.3 Threats and Priority Conservation Actions for Bedrock Glade

3.3.4.4.3.1 Statewide Overview of Threats and Priority Conservation Actions for Bedrock Glade

The following list of threats and priority conservation actions were identified for bedrock glade in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.4.4.3.2 unless otherwise indicated.

Threats and Issues

- Mining could pose a threat in areas bearing metallic minerals within the underlying bedrock. Non-metallic mining can also pose a threat to this community.
- Unsustainable grazing can disturb thin soils and impact plant communities.
- Off-road vehicles and heavy foot traffic can destroy fragile organisms such as lichens. The recovery times for vegetation can be exceedingly long in these dry, nutrient poor habitats.
- Lack of fire can result in establishment and/or expansion of woody species such as eastern red cedar and excessive shading of the herbaceous and low shrub vegetation. However, frequent fire is undesirable if fire sensitive organisms are known or suspected of occurring at a given site. It may, in fact, be impossible to burn because of low fuel loads and the difficulty of running fire through areas with spare vegetation and exposures of bare rock.
- Non-native invasive plant species can replace native species.

Priority Conservation Actions

- Acquire surface and subsurface mineral rights.
- Provide incentives to limit grazing.
- Protect sites from off-road vehicle use and heavy foot traffic.
- Manage with a combination of prescribed fire and mechanical methods to remove cedar and other undesirable species as needed. Where possible, manage in habitat mosaics. Depending on the region of the state, these might include cliffs, dry prairies, savannas, and a variety of dry forest communities.
- Monitor for presence of invasive species and respond as deemed necessary.
- Additional surveys for rare plants and animals are needed in most areas where glade vegetation occurs.

3.3.4.4.3.2 Additional Considerations for Bedrock Glade by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of bedrock glade exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for bedrock glade found in Section 3.3.4.4.3.1.

Additional Considerations for Bedrock Glade in Ecological Landscapes with ***Major*** Opportunities for Protection, Restoration, and/or Management

North Central Forest

Much of Northern Wisconsin is underlain by pre-Cambrian granite. "Glades" are uncommon in this heavily forested region but they do occur along several rivers (e.g., the Wolf), on some of the bedrock knobs and mounds in the Chequamegon-Nicolet National Forest, and on the Penokee Range found within the Iron County Forest.

Western Coulee and Ridges

The Baraboo Hills harbors many bedrock glades, with most of them occurring on quartzite. Glade management can be incorporated into parcel-level and landscape-scale management plans for the area on public lands such as Devils Lake State Park and nearby privately owned lands that are managed at least partially for conservation purposes. Examples from the Baraboo Hills include the Caledonia Glades and Devil's Nose, both in Sauk County.

Additional Considerations for Bedrock Glade in Ecological Landscapes with ***Important*** Opportunities for Protection, Restoration, and/or Management

Central Sand Hills

Some outcrops of shallow bedrock exist here. Bedrock glade communities exist in places such as the abandoned Badger Army Ammunition Plant. A management plan for state property at this site will likely be developed once transfer from the federal government is completed. This may open some of these areas to visitation, and increased foot traffic, and could impact the plant and lichens assemblages, which are vulnerable to damage. Some of the flat-topped sandstone bedrock features at Mill Bluff State Park (Monroe and Juneau Counties) also support glade vegetation.

Forest Transition

McCaslin Mountain is underlain with quartzite and hosts glade communities that can be managed on national forest lands. The greatest concentrations of glades in this Ecological Landscape are along the Lower St. Croix River, in and around Interstate State Park (Polk County). An example of this community can also be found at Butler's Rock within the Oconto County Forest.

Western Prairie

Some bedrock glade occurrences exist in the lower St. Croix Valley, over basalt bedrock. Osceola Glade, in Polk County, is the best known example.